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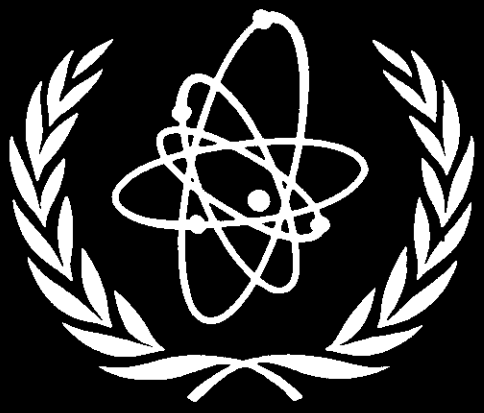

Planning and Designing IAEA Technical Co-operation Projects

GUIDELINES

DEPARTMENT OF
TECHNICAL
CO-OPERATION

July 1997

FOREWORD

These Guidelines provide an approach and tools to help plan and design quality projects and prepare "sound" project requests for submission to the IAEA Secretariat for review. The document focuses on project planning and design within the larger context of the full project cycle, namely planning, implementation and evaluation.

The target audience are Member State Counterparts and institutions responsible for preparing project requests for IAEA (Agency) Technical Co-operation and Agency staff responsible for reviewing and selecting project proposals. When necessary, training workshops on the process will be held to help facilitate the use of the Guidelines.

These guidelines propose a method - IAEA's Technical Co-operation Project Framework, adapted from what is widely known as the "Logical Framework" - to be used as a tool in project design and for managing the TC project cycle. The ideas outlined in the Guidelines are based on Agency experience and advice and reference documentation provided by AusAID (Australian International Development Agency), CIDA (Canadian International Development Agency), the Commission of the European Communities, GTZ (German Technical Co-operation Agency), ILO (International Labour Organization), NORAD (Norwegian Development Agency), UNIDO (United Nations Industrial Development Organization), and other technical assistance agencies.

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❶ *The IAEA Technical Co-operation Strategy*

CONTEXT OF THE IAEA PROGRAMME OF TECHNICAL CO-OPERATION

One of the IAEA's objectives is to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity in Member States by facilitating their access to the application and utilization of nuclear energy, transferring technology, and promoting co-operation between them for that purpose.

THE STRATEGY

In pursuing this objective, and in line with the recommendations of the 1994 Technical Co-operation Policy Review Seminar, the Department has formulated a ***new strategy***:

This goal is embodied in the concept of "Partnership in Development" - the Agency shall become a partner with each Member State, co-operating in the process of achieving sustainable development.

Promote tangible socio-economic impact through Technical Co-operation with Member States by contributing in a cost-effective manner to activities addressing high development priorities of each country.

Two major programming mechanisms are adopted to achieve this goal: **Country Programme Frameworks** and **Thematic Planning**. Through these, Member States and the Agency co-operate in identifying projects that:

The Model Project concept

- *respond to a real need;*
- *reflect an indispensable role for the nuclear technology involved;*
- *produce significant economic or social impact; and*
- *have demonstrated potential for sustainability through strong Government commitment.*

Such projects are referred to in the Agency's terminology as **"Model Projects"**.

Agency TC projects are approved for a period of two years of implementation (**biennium**), e.g. 1999-2000

Country Programme Frameworks

CPFs have already been prepared for a number of Member States, thus providing the framework of mutual understanding of the priority areas for TC assistance

A Country Programme Framework (CPF) is the mutual understanding between the Agency and an individual Member State with regard to the co-operation in the application of nuclear technology supporting national development objectives in the medium term (4-6 years). Furthermore, the CPF identifies opportunities for high quality Agency supported TC projects with visible socio-economic impact using nuclear technology, oriented towards the end user and with assured Government support and contribution.

Thematic Planning

Thematic planning is a tool for establishing the contributions to development that are possible through the Agency. Thematic plans are also the means by which the Agency establishes broad programme goals to address mandated activities, such as meeting minimum standards in radiation protection.

PROGRAMMING IAEA TECHNICAL CO-OPERATION

Programming of TC activities is governed by a policy of continuous dialogue with Member States. A TC programme biennium is preceded by a two year preparatory phase. Thus, for the 1999-2000 biennium of the TC Programme, the preparatory phase is during 1997-1998.

Preparation and submission of project requests

During the first year of the preparatory phase, Member States prepare requests (proposals) for projects needing Agency support. Member States may request the Agency for expert assistance in project formulation. Activities of the first year culminate in the submission of project requests by Member States - deadline December of the first year of the project preparatory phase (e.g., December 1997 for the 1999-2000 biennium).

Appraisal of project requests

Project requests are appraised by the Agency during the second year of the preparatory phase. The Model Project criteria form the main basis for the appraisal. During the appraisal year extensive consultations are held with Member States requesting TC assistance. Project reformulation missions are fielded when necessary.

Programme approval and implementation

Projects selected during the appraisal are submitted to the Board of Governors for approval in December of the second year of the preparatory phase. Projects approved by the Board are implemented during the next two years following a clearly defined plan of work.

THE SECTORS OF IAEA TECHNICAL CO-OPERATION

The Agency's TC Programme is structured around ten major sectors covering nuclear power, and nuclear applications in agriculture, human health, industry, hydrology and the environment.

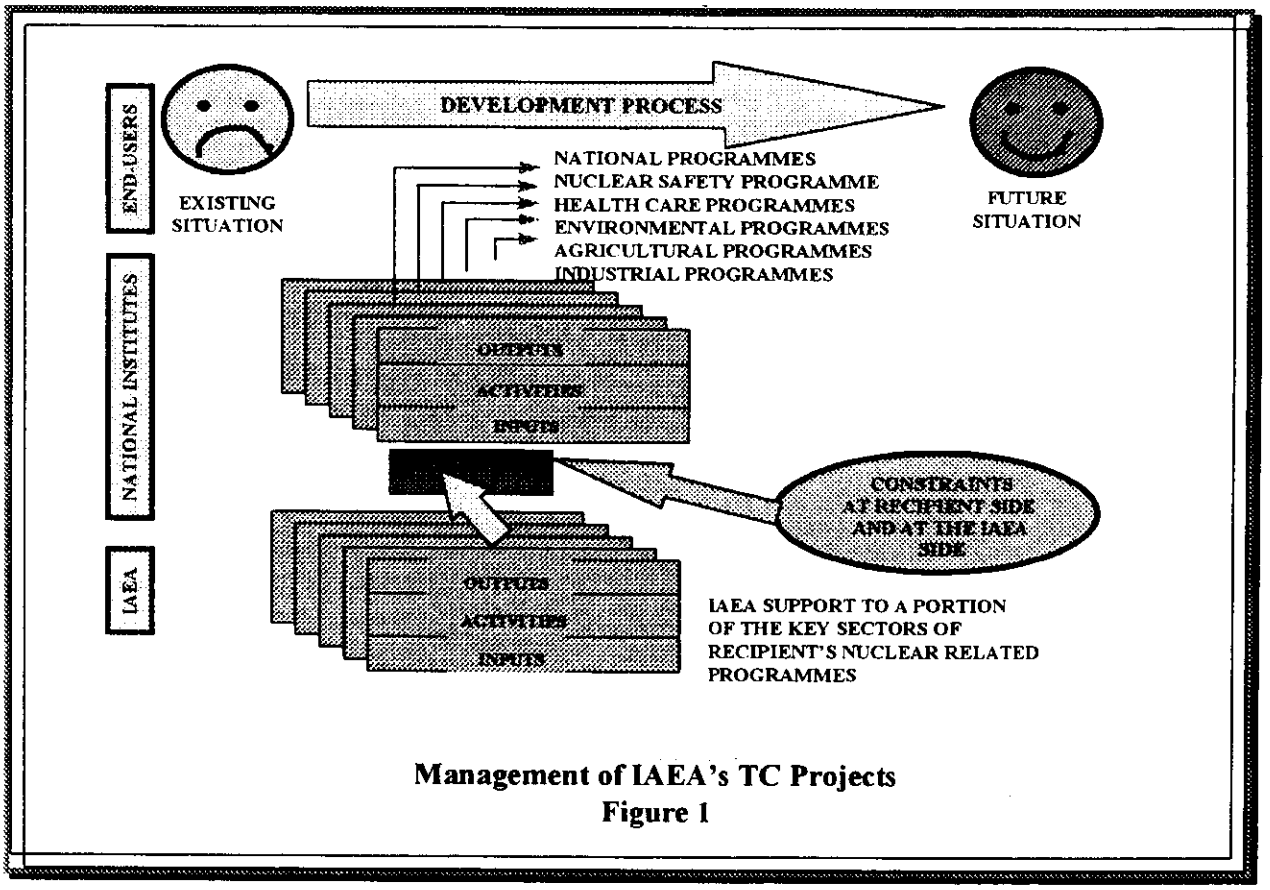
As recommended by the TC Policy Review Seminar held in November 1994, special attention needs to be given to the adequacy of the health and safety infrastructure in the Member States.

❷ *The principles and structure of Technical Co-operation*

THE STRUCTURE OF TECHNICAL CO-OPERATION

The IAEA recognizes that Member States recipients of technical co-operation, their governments and institutions, are responsible for the management of the identification, formulation and implementation of their own development or technical programmes.

A conceptual structure of technical co-operation is represented in figure 1.



Management of IAEA's TC Projects
Figure 1

The responsibilities of Member States

However, institutions in recipient Member States require financial resources, qualified manpower and other types of support from other local institutions, as well as government policies which are conducive to a favourable working environment. These constitute the national capabilities required to ensure sustainable undertakings.

The responsibilities of the IAEA

The IAEA is responsible for managing a variety of services designed to enable its counterparts in Member States to overcome constraints to the identification, formulation and/or implementation of their own development programmes or projects. These services may take the form of programmes or projects. The impact and sustainability of IAEA services is measured through the improved ability of its counterparts to satisfy the needs of end users, target groups or beneficiaries.

It is the IAEA policy to ensure that its services meet the standards of relevance, cost-effectiveness and sustainability set by Member States through its policy-making organs.

The TC project definition

A TC project is a set of activities with a defined objective directed toward solving an identified problem (situation or need) and clearly established duration, within the framework of roles and responsibilities referred to above.

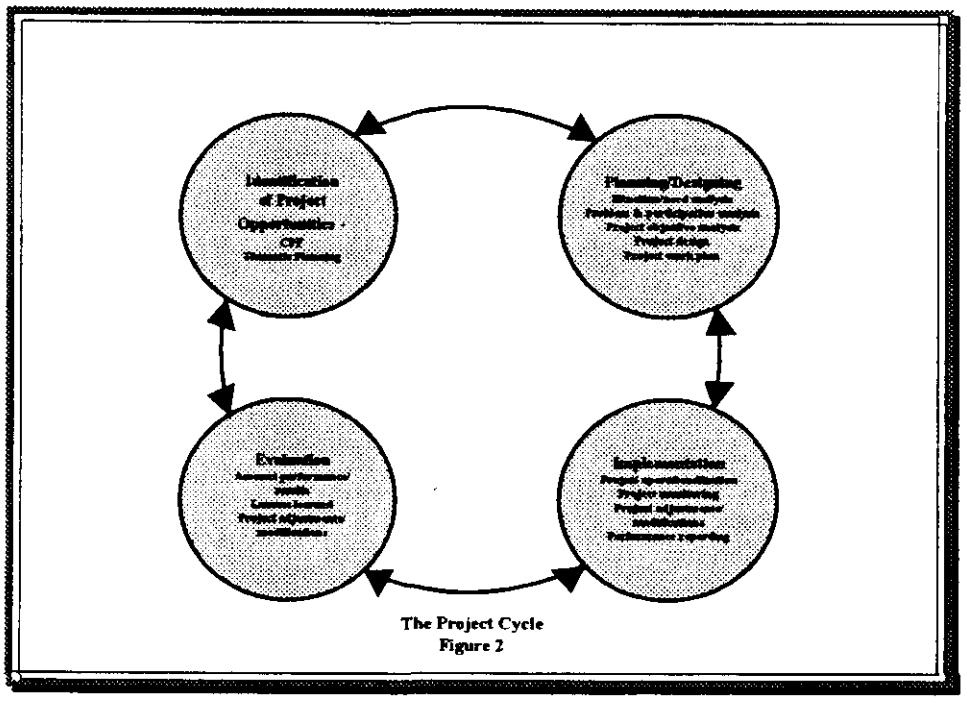
THE PROJECT CYCLE

The ***project cycle*** is a process involving the following four phases:

- identification of the project,
- planning and design,
- implementation, and
- monitoring and evaluation.

The four phases feedback into each other throughout the project cycle, as shown in Figure 2.

The IAEA TC project framework and the project planning/designing steps recommended for use throughout this process are described in Chapters 3, 4 and 5 respectively.



The Project Cycle
Figure 2

❸ *IAEA's Technical Co-operation project framework*

WHAT IT IS

IAEA's Technical Co-operation Project Framework is a tool to help think through and analyse the "logic" of a project and, thereby, to ensure a quality project and a sound project proposal. It is based on the **"Logical Framework"** *concept which has been used by many* technical co-operation agencies.

WHY IT IS NEEDED

Major weaknesses in projects are due to:

- Lack of ***discipline needed to analyse*** a situation and make the right decisions at the right time over the project cycle, leading to invalid project ideas slipping through at the initial stages of programming; valid ideas not being subjected to pre-feasibility scrutiny and financing approved without feasibility analyses;

- ***Overlooking, particularly during project formulation and planning, essential factors*** such as: clear and realistic objectives; the need to strengthen managerial skills to run the projects; the need to emphasize the economic and financial viability of projects and the provision for risks.

The project framework is a systematic and structured way of thinking and analysing

The TC project framework is intended to minimize these weaknesses by structuring the formulation of the project in a careful manner so that the major components are explicitly and clearly interrelated. *While the framework is useful throughout the* ***project cycle, including during monitoring and evaluation,*** it performs a particularly critical role in the early stage by ***structuring*** the elements comprising the project design and work plan, ***analysing*** the ideas and their interrelationship, and ***formulating*** the details of the project work plan.

The TC project framework matrix*, shown on the following page,* ***is used during the project planning/designing stage to analyse the problem, develop an intervention strategy and a detailed work plan that relates the project's objective to the Member State's needs in light of identified opportunities and risks.***

The framework provides a consistent scheme for analysing problem situations and for ensuring that all factors essential for project success are addressed. Furthermore, if an objective is misconceived, or badly chosen, or the intervention logic insufficiently prepared, it can help to reveal the contradictions.

If applied consistently, it assists in screening relevant projects and in improving design quality, ultimately leading to better chances of achieving the intended impact.

THE PROJECT FRAMEWORK MATRIX

The project framework matrix organizes the underlying project elements, comprising the most important aspects of the project. The matrix has four columns: Column I constitutes the project design and work plan; Column II outlines the objectively verifiable performance indicators used to judge "success"; Column III indicates the means of verifying the indicators; and Column IV notes the main assumptions that may influence the course of the project. An example is given in Figure 3 below.

	Project Design Elements	Verifiable Indicators	Means of Verification	Important Assumptions
Contribute →	**Development/ Overall objective** • The broader level of results.	Signals allowing measurement of changes.	Baseline versus end-of-project data.	External factors, outside direct project control, to be monitored by the management.
Achieved →	**Specific objective** • What is expected to be achieved.	•What exactly. •For whom. •By when.	Sources of data substantial, factual, recorded.	If ..... Then
Produced →	**Project outputs** • The "products" or results to be produced by the project's activities.	How big, how much, how many. •How good. •By when.	Quantity and quality benchmarks.	
Performed →	**Activities** • Actions taken or planned to produce the outputs.	Milestones and targets.		PRECONDITIONS
Provided	**IAEA + CP inputs** • Expert advice • Lab equipment • Lab building	Type, time, quantity, quality.		

The project framework matrix
Figure 3

Column I: Project design elements

The project's design, as represented in column I, contains the following specific elements: need/problem, *overall objective, specific project objective, performance indicators including outputs, activities, and inputs, linked between themselves by* ***logical cause-effect relationships***.

The overall objective is the highest level result to which the project will contribute directly or indirectly. It explains why it is necessary to carry out the project. Any particular project may be understood as one of a number of contributing activities to the overall objective. The overall objective expresses the improvements expected to be achieved in the situation of the target group after the objectives of all the contributing projects have been achieved.	***Development/Overall objective***
The specific project objective expresses what is expected to be achieved through the use of project outputs, and for whom (end user or target group), if successfully completed in a given time, i.e. normally to enable the counterpart institution to overcome its constraints.	***Specific project objective***
Project outputs are the immediate results that can be guaranteed by the IAEA as a consequence of project activities carried out during implementation, i.e. ***what the project aims at producing***: ***producing the outputs must lead to achieving the project objective***. These are the "deliverables" for which the project is held directly accountable and for which it is given resources.	***Outputs***
Project activities are the actions taken or planned to ***transform the inputs into outputs***: how the project intends to produce the outputs.	***Activities***
Project inputs are the products, services, or resources (financial, human, materials etc.) from various sources that are needed (necessary and sufficient) to carry out activities of the project.	***Inputs***
Column II shows the project's performance indicators. They are the "signals" that allow the measurement of achievement of the main design elements and must provide quantifiable and verifiable evidence of the progress made towards the objective.	**Column II: Performance indicators**
*Performance indicators describe and **specify** what is expected to be obtained through the use of the outputs by the direct recipients, in terms of **quantity***: how much, how many; ***quality***: how good or how well; ***target group***: for whom; ***time and location***: by when and where.	***Performance indicators for the project set up at the project design stage will be used as yardsticks against which actual achievements will be compared during monitoring and evaluation.***
The progress in performing project activities, in delivering inputs and in producing outputs is "measured" or verified by managers through the ***milestones*** established at the project outset.	

Column III:
Means of verification

Column III should indicate the sources of information necessary to verify the accomplishment of the indicators and should include the information which is to be made available, in what form, by whom and when.

Baseline data, implementation records and progress reports are necessary to monitor and evaluate the achievement of the project's objective.

Column IV:
Assumptions

Assumptions are conditions that must exist for the project to succeed but which are outside the direct control of the project management. They are "positive conditions" that are logically necessary for the activities to lead to the outputs, for example.

Among the external factors to be considered are the other activities or projects contributing to the Overall Objective that need to be carried out (even if outside the project) so that it is reached.

The likelihood of these assumptions should be analysed at the formulation stage and monitored throughout implementation, as it is a decisive factor for taking corrective actions or modifying the work plan. Assumptions that are both important but improbable are "killer" assumptions that cannot be planned: in such cases the project design should be changed, otherwise the project must be abandoned.

COMPLETING THE MATRIX

For completing the TC project matrix an example is contained in Figure 3 above.

Bear in mind two basic principles:

- Go from the general to the specific; and
- Consider the linkage or interrelationship of the elements one to another, commonly referred to as the "cause-and-effect" (or "if-then", i.e., "if we do this, then we can expect that...") logic. The logic or interrelationship between Column 1 and 2 is particularly important.

The matrix helps make the logic and relationships explicit.

❹ *Project planning and designing steps*

Project planning and design involves developing the project in response to an identified opportunity, problem or need. A logical thinking process takes place, including the following steps:

Step 1:
IDENTIFYING PROJECT OPPORTUNITIES

The planning and design process begins with identifying the opportunity, analysing the situation and needs, determining whether the Agency has a role to play and, if so, the best course of action, and agreeing on clear objectives, a work plan and associated resources. It requires a critical assessment of the relevance and value of specific activities prior to making a decision to undertake or continue the project.

The major concerns

At the early stages of country programming, project ideas are identified as part of the discussion between Member States and the Secretariat in mutually establishing the focus of future Agency activities. The major concerns at this stage are: ***national, sectoral and institutional relevance, potential socio-economic impact, and sustainability***.

Relevance

Relevant projects are those which are necessary to solve the problem/need and the outputs are necessary to achieve the objective through ***direct and verifiable*** relationships.

Potential socio-economic impact

The potential socio-economic impact is estimated by the magnitude of the problem. The National Government commitment to and ownership of the project are key in this regard.

Sustainability

Sustainability refers to the extent to which the improved situation (as resulting from the achieved objective) can be maintained by the users on their own. It is linked, among others, to the local availability of funds for continued operation, maintenance of equipment, spares and re-training of staff, and to the institutional and managerial capabilities.

On the basis ***of the situation analysis***, and any feasibility studies conducted to determine if the project idea is viable, the specific project objective of the IAEA project is established, a detailed ***project design and work plan*** is prepared containing the following elements: development and specific objectives, outputs, activities and inputs, as well as the corresponding performance indicators and assumptions.

Step 2:
SITUATION OR NEED ANALYSIS

Planning a project that addresses the real needs of target groups or users can only be achieved on the basis of full and accurate analysis of the existing situation.

Problem analysis

A project designer must analyse the situation carefully to identify

- the major **problems**
- their **causes**, and
- their **effects**.

A systematic way of doing this is using **the "problem analysis tree"**. The value of the analysis tree increases with the detail and accuracy of the information available on the causes and effects of a problem. ***This emphasizes the importance of conducting technical, economic or social studies*** (often called "feasibility studies") ***as part of problem and participant analysis when the necessary information does not exist.***

Participant analysis

Analysing the problem also involves identifying the participants -- i.e. the parties affected, as these will be the "clients", sponsors or partners in the process of solving the problem -- and gaining their support for and participation in the project from the earliest possible moment.

A thorough problem and participants analysis permits clear definition of the problem (problem statement) and establishes points of focus for planning and directing a project.

A good situation analysis

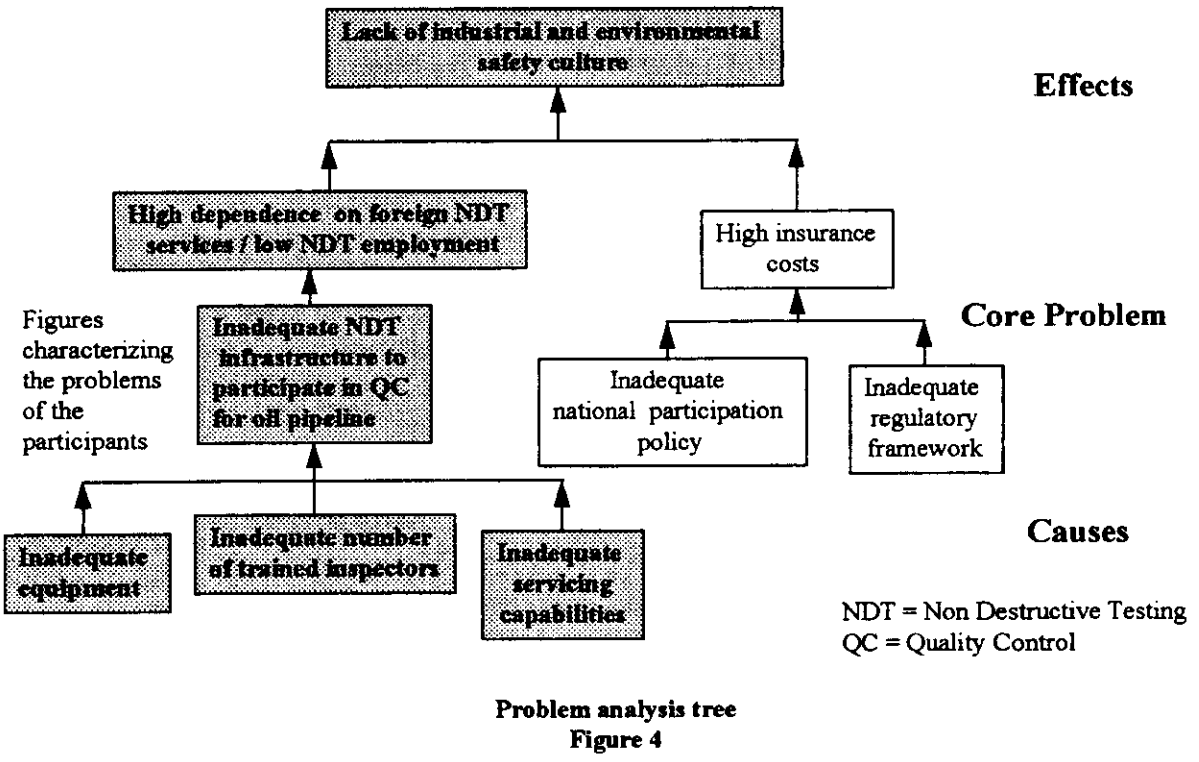
- defines a major situation that needs to be changed or attended to
- defines **what** the problem is, **who** is affected and **how**, and **where** the problem is located
- quantifies the problem where feasible.

A thorough analysis of the situation and of the sector involved helps to reveal those weaknesses of the project partnerships that later prevent the achievement of the project's objectives.

For example, the application in geological surveys of the nuclear analytical techniques available at the Physics Department of any University, would require the involvement of the Ministry of Mineral Resources and/or of the local industries interested in exploration or exploitation of available resources. Without such a partnership, survey activities, such as sample collection, would be difficult. Additionally, the likelihood of the results of the study reaching end-users is very low.

A sample application

Figure 4 shows a simplified example of a problem analysis tree. It refers to an opportunity identified by a Member State in relation to the construction of an oil pipeline across their territory. The national ambition existed for developing a core national capability for verifying the environmental safety of this pipeline and for participating in other projects requiring these services. ***The structure of the existing Non Destructive Testing (NDT) sector was analysed*** and the constraints identified for a minimum national participation in this NDT project consisted of inadequately developed safety regulations, lack of NDT inspectors certified to the adequate level, limited equipment availability and inadequate servicing capability to participate in the NDT process.



Problem analysis tree
Figure 4

Step 3:
OBJECTIVE ANALYSIS

Objective analysis/setting involves converting the negative situations in the problem analysis tree into positive situations and making the necessary adjustments. Thus, the "problem statement" converts to the "**overall objective**" and the "effects" convert to "**specific objectives**". In other words, the ***cause-effect*** relationships of the problem analysis tree convert into a ***means-ends*** relationship in the ***"objective analysis tree".***

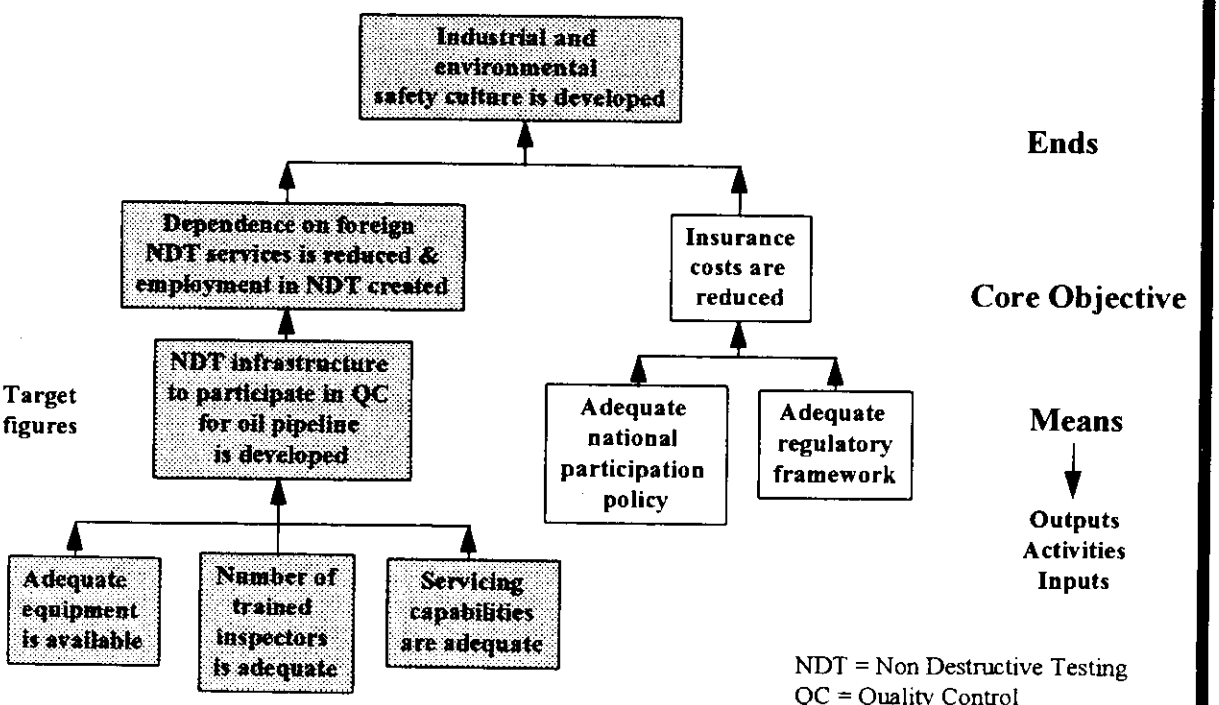
The objective tree may show some objectives that cannot be achieved by the project envisaged, and so a choice has to be made. Furthermore, some objectives may prove to be unrealistic so other solutions to the problem need to be found.
A good objective analysis is based on the situation analysis and should lead to:

- Identification of the main result or change towards which activities and resources are directed;
- Objectives which are consistent with the overall policies of all participants or stake holders and the priorities identified in the CPF;
- Defining the responsibilities for achieving each objective.

The example of figure 5

The objective tree in Figure 5 was developed from the problem analysis tree given in Figure 4.

The objective of the project example described previously was the development of a core of national capabilities to participate in the NDT project, with the overall objective of sustainability in the local market context. In Figure 5, the means define some of the outputs to be produced by the IAEA project while others were to be produced by other parties involved.



Objective analysis tree
Figure 5

A project design and work plan should reflect/address the following criteria or standards as described in (a) through (f):

Step 4:
DESIGNING THE PROJECT - Quality criteria

(a) Project design

- ***The project objectives and outputs are unambiguously and operationally defined so as to make verification possible.***
- ***Performance indicators and target dates are defined to measure the achievement of objectives.***
- Baseline data has been obtained substantiating the nature and magnitude of the problem or opportunity that the project addresses.
- Key constraints or aspects needing support are identified and are adequately addressed in the project plan.
- The users of the outputs are involved in the project, and the links with beneficiaries, target groups or end users are defined.
- Appropriate design features are incorporated to address possible risks identified.
- Inputs, both the Agency's and other parties', are necessary, adequately specified and fit into the context of the aspects needing support and into the time schedule foreseen.
- An adequate level of project design documentation is available.

(b) Work planning

A project work plan shows **how** and **when** the defined project activities are to be carried out to achieve project objectives with ***appropriate milestones***.

A good work plan is prepared for each output and

- focuses on concrete project activities and clearly indicates
    - what is to be done,
    - when it is to be done,
    - who will do it;
- should provide the basis for developing terms of reference for contracting out certain activities etc.;
- provides direction for implementation of project activities and the application of necessary resources.

(c) Technical merit

- The project utilizes the best available technology, practice or state-of-the-art approach to address the problem.
- The project is likely to advance the knowledge base within the field.

(d) Implementability

A realistic budget to implement the project has been secured. The sources of funding to the project are reliable and adequate.

(e) Manageability	• The project's main counterpart has the managerial and technical skills as well as previous experience that substantiate the capability to lead the project to its objectives. If additional management support is necessary, this need is addressed by the project plan. • The roles, responsibilities, links and lines of authority between participating partners are clearly defined. • A well-dimensioned and competent project team has been envisaged. • The agreements between the project partners are formalized. • Provisions to follow up, monitor and report on progress and results are included. • Contingency provisions have been included.
(f) Cost-effectiveness	• Broad plans for "exploiting" project outputs are set up. • The approach proposed to execute the project is in line with good management practice.

❺ *From planning and designing to implementation and evaluation - A coherent approach*

IMPLEMENTATION

Implementation is the process of managing the production of outputs through the project activities.

More specifically, project implementation is to be ***monitored*** against three primary reference points developed during the planning/designing phase:

(a) Project schedule and budget are monitored to determine if they are proceeding according to the work plan.

(b) Progress towards achieving the specified performance indicators is monitored through the data gathered as foreseen during the project planning stage and reported according to the provisions. The pertinence and viability of the project objective and outputs are to be kept under focus.

(c) Assumptions made are also monitored as a change of external factors may lead to redesigning different aspects of the project or work plan.

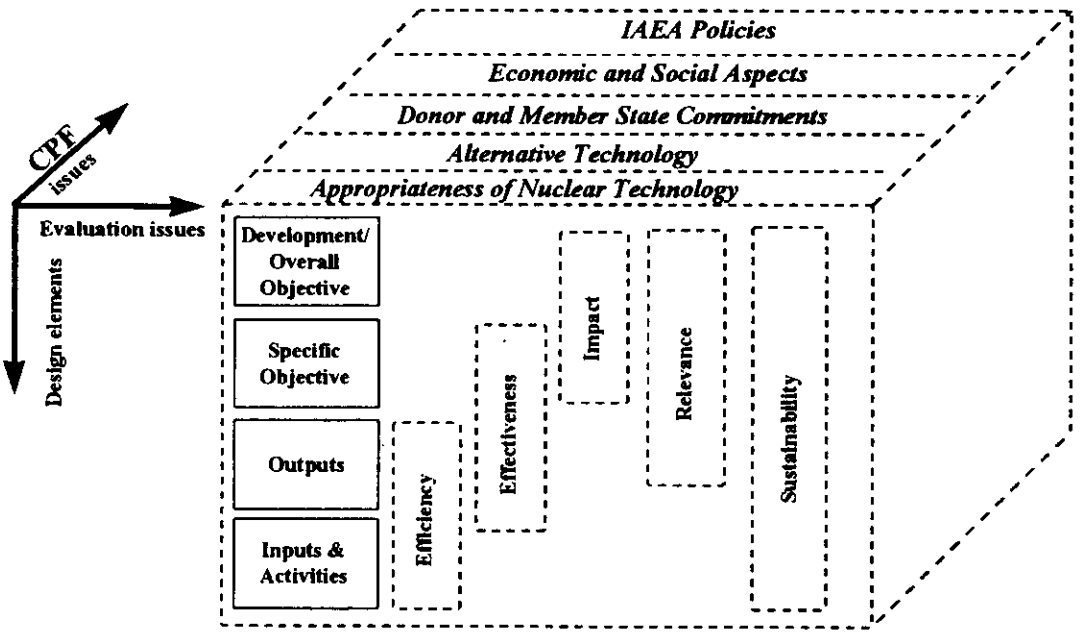
In all three cases, corrective actions and adjustments are made accordingly.

CLOSING THE PROJECT CYCLE - EVALUATION

Evaluation is the process of systematically assessing the extent to which the project has achieved or is achieving its stated objectives and is having the desired results on the problem/need.

Figure 6 represents an evaluation framework, consistent with the TC project framework followed throughout the project cycle.

Project evaluations address efficiency, effectiveness, impact, relevance, and sustainability, reflected in the TC project framework matrix, as well as the same standards and criteria that followed throughout the project cycle.



Evaluation Framework
Figure 6

Efficiency

Efficiency, i.e. how well inputs are converted into outputs, is determined by the following factors:

- *project design quality*, measured by the appropriateness and linkage of inputs and the activities that transform them into outputs;
- *project implementation*, measured by adherence to schedule; timeliness and fitness-for-purpose of inputs, and budget utilization; and
- *management performance*, measured by the ability to monitor progress and take corrective actions.

Cost-effectiveness, as a result of combining the issues mentioned above, is assessed by reviewing the utilization or exploitation of the outputs, and when meaningful, by comparing the approach adopted with other options.

Effectiveness

Effectiveness defines the extent to which a project has achieved or is likely to achieve its main objectives.

Impact

Project impact is the longer-term effects on the problem situation or need which relate to the Development/Overall Objective. It is the higher order result that this project, when combined with others, will achieve (as stated in the Overall Objective).

Impact relates to the magnitude of the benefits that result by comparing them against the pre-established performance indicators at the levels of development and specific objectives.

Relevance and sustainability

Relevance and sustainability are assessed in similar terms as at the project formulation stage.

Evaluation need not be done just at the completion of a project; it can also be undertaken at a critical stage after the project has been under way for some time. The underlying purpose of the evaluation is to identify and build on the lessons learned in a constructive manner that facilitates performance on the project itself or similar efforts elsewhere.

CRITICAL INGREDIENTS

In all phases of the project cycle, certain "ingredients" are critical to success:

- team approaches to developing, implementing, and evaluating projects;
- continuous communication and co-ordination to ensure regular feedback to all major stakeholders throughout the entire process; and
- an attitude of constructive engagement to ensure even the most difficult of challenges has a reasonable chance of resolution.

Only by closely adhering to these basic principles will the project process outlined above have a chance of becoming a "living reality."